Building Revolutions: Applying the circular economy to the built environment

David Cheshire, AECOM
WASTE AS A RESOURCE

RECYCLE/COMPOST

REMANUFACTURE

RECLAIM/REUSE

REFURBISH

REFIT

RETAIN

BUILDING IN LAYERS

DESIGNING OUT WASTE

DESIGN FOR ADAPTABILITY

DESIGN FOR DISASSEMBLY

SELECTING MATERIALS

CIRCULAR BUSINESS MODELS

DESIGN PRINCIPLES
Building in layers

- Designing out waste
- Design for adaptability
- Design for disassembly
- Selecting materials
Building in layers

(Stewart Brand)
White collar factory

Courtesy of Derwent London
Scenario modelling has been carried out to demonstrate how each floor can be reconfigured for different functions.

- Generous cores allow for future adaptation.
- 4.2m floor-to-floor heights can accommodate a variety of uses.
- Exposed services offer a ‘plug and play’ option and provide easy access for repairs.
- Flexible rectilinear grid facilitates future extension.
Villa Camera Facility House, Media Park, Hilversum (Jouke Post)
Y:Cube Mitcham
F18 (Efficiency House Plus) Werner Sobek
RMF ECO-Range

RMF are the market leaders and the UK's largest raised floor recycling company.

The RMF ECO-Range is further testament to our commitment to the environment, and the creation of new practices through our raised floor recycling innovation. The RMF ECO-Range can help improve construction BREEAM ratings and Ska M07 criteria.

BREEAM can be used to assess the environmental performance of any type of building, new and existing, anywhere in the world. BREEAM is an internationally recognised brand across the world, setting the standard for sustainability in the built environment.

The RMF ECO-Range not only encourages buyers just to think about the "bottom line", but it is slowly educating them into a "greener" more sensible and sustainable way of approaching their projects.

These products are available from us either supply only or on a supplied and installed basis, where we install onto new pedestal under structure, to the required floor height and are supplied tested and fully warranted.

We always have a comprehensive stock of around 100,000 second user ECO-Range panels available.

If you have a project where the existing raised floor is being stripped out, we would be pleased to hear from you please email us stripout@rmf-services.co.uk

We are market leaders in raised access flooring recycling. Listed below is the RMF ECO-Range fully warranted product range.
Reclaimed raised floor tiles

Raised access floor tiles
- Capital costs: £40,000
- Lifecycle replacement: £177,500
- FM Costs: £60,000
- End of Life: £13,800

Reused raised access floor tiles
- Capital costs: £33,500
- Lifecycle replacement: £130,000
- FM Costs: £60,000
- End of Life: £13,800
“The light as a service means that, Schiphol pays for the light it uses, while Philips remains the owner of all fixtures and installations.

Philips and Cofely will be jointly responsible for the performance and durability of the system and ultimately its re-use and recycling at end of life. By using energy-efficient LED lamps, a 50% reduction in electricity consumption will be achieved over conventional lighting systems.”
Rемануфактурированное краска

• Ремануфактурированное краска обходится примерно так же, как обычная краска схожего качества, но скидки могут быть доступны через участие в программе рециклинга краски.
• В одном исследовании (Дебенхамс) оценивалось, что экономия составляла 22-24%, включая стоимость покупки и удаление ненужной краски.
ANWB Reizen building with Bosch Siemens building in the foreground (Delta Development Group)
Bosch Siemens
(Delta Development Group)
Slimline flooring system

Courtesy of Slimline™
Benefits of circular economy buildings

From: Building Revolutions, RIBA
Based on initial assessment of the 202,000m² GIFA Merton Regeneration project the scale of benefits that may be realised through comprehensive implementation of the Circular Economy Strategy are significant. For the demolition and construction phase benefits could include:

- **£5,000,000** cost savings in waste disposal and materials purchase;
- **16,500** fewer HGV movements;
- **7,760** tonnes CO₂ e saving, equivalent to the annual operation of approximately 2000 homes; and
- **122,000** tonnes of virgin material use avoided.
3.12 Figure 3.1 shows a hierarchy for building approaches which maximises use of existing materials. Diminishing returns are gained by moving through the hierarchy outwards, working through refurbishment and re-use through to the least preferable option of recycling materials produced by the building or demolition process. The best use of the land needs to be taken into consideration when deciding whether to retain existing buildings in a development.

Figure 3.1 - Circular economy hierarchy for building approaches

Source: Building Revolutions (2016), David Cheshire, RIBA Publishing ©

London’s circular economy route map, GLA & London Waste and Recycling Board. 2017
The Enterprise Centre
"Buildings as material banks, energy generators and service providers… The future of architecture and construction will play a key role in the transition to a circular economy, and David Cheshire’s book makes a compelling case for a profound rethink."

The Ellen MacArthur Foundation

"I welcome the work David Cheshire has put into articulating a different future for an industry with so much potential for greater efficiencies."

Julie Hirigoyen, CEO, UK Green Building Council
Thank you

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